

E4 sub F3 > --12. (New) The photoelectric conversion element according to claim 10, wherein a p⁺ layer is provided between the p⁻ layer and the electrode, and the electrode is in contact with the n⁺ layer.--

REMARKS

Claims 7, 9, 10 and 12 are pending with Claims 7 and 10 being the only independent claims. Claim 11 has been cancelled without prejudice. Claim 12 is being added to provide Applicants with a more complete scope of protection.

As courtesy to the Examiner, submitted herewith is a copy and English translation of a Chinese Official Action issued in a counterpart of the present application. The Chinese Official Action cited U.S. Patent o. 5,135,884, issued to Miller, which is a counterpart of EP 0 506 473 A2, already of record in the present application. A copy of U.S. Patent No. 5,135,884 is enclosed as a courtesy to the Examiner.

Claims 7-9 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,394,826 (Ebe et al.). Claim 7 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,001,864 (Gibbons.). Claims 7 and 9 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,045,614 (de Lyon et al.).

Independent Claim 7 is directed to a semiconductor device comprising a substrate and formed thereon an active layer having the principal plane of (111)-plane, the active layer being used in photoelectric conversion, where an angle formed by any arbitrary two cutting lines not coming into coincidence is represented by θ , and the active layer has a cutting angle of $|\cos\theta| = \frac{1}{2}$ or $3^{1/2}/2$.

By virtue of the invention defined in Claim 7, since an active layer can be cut by utilizing the cleavability of the (111) substrate, the area of the active layer to be discarded can be made smaller, allowing semiconductor resources to be more effectively utilized (see specification page 39, lines 7-13).

The Examiner took the position that Ebe et al. has the recited cutting lines at col. 3, lines 60-62. However, Applicants find no such teaching. Ebe et al. teach slip in a CdTe (111) plane epitaxially grown on silicon (111) plane. More specifically, Ebe et al. disclose that since $\langle 111 \rangle$ direction of silicon (111) plane and $\langle 111 \rangle$ direction of CdTe (111) plane are deviated at 30 degrees, $\langle 211 \rangle$ direction or $\langle 121 \rangle$ direction of CdTe (111) plane is consistent with $\langle 110 \rangle$ direction on silicon (111) plane. The disclosure of Ebe et al. has no relation to the angle formed by the cutting lines defined in Claim 7 of the present application. Accordingly, Claim 7 is believed clearly patentable over Ebe et al.

Amended independent Claim 10 is directed to a photoelectric conversion element comprising an anti-reflection layer, semiconductor layers, and an electrode, provided from the light incident side. All of the silicon layers are epitaxial silicon layers, and the silicon layers comprise an n^+ layer and a p^- layer provided from the light incident side. By virtue of the claimed structure, since all the active layers are epitaxial silicon layers, the active layers exhibit a higher quality than active layers comprised of wafer material.

In the photoelectric conversion element defined in Claim 10, all the silicon layers, e.g., the n^+ layer and the p^- layer, are epitaxial layers. As a result of the structure defined in Claim 10, since all the silicon layers constituting the photoelectric conversion element are epitaxial silicon, the probability that the generated photocarrier can be taken as an electric current

is large, and therefore a photoelectric conversion element with high photoelectric conversion efficiency can be obtained. This is because epitaxial silicon has a small oxygen content and has a large carrier lifetime, compared with single silicon formed by pulling up from a quartz crucible.

The solar cell disclosed in Gibbons uses a substrate having many defects as an underlying on a side of a back surface electrode (see Abstract and col. 9, line 63 to col. 10, line 2) and all the silicon layers are not epitaxial layers. In the present invention, an epitaxial layer having a long lifetime is used for all the silicon layers. In contrast, in Gibbons, since an underlying substrate having a short carrier lifetime is used, the probability that photocarrier can be taken out as electric current becomes small. Gibbons has self-acknowledged that defects reduce carrier lifetime (col. 9, lines 29-31). For at least the reasons mentioned above, Claim 10 is believed patentable over Gibbons.

A review of the other art of record has failed to reveal anything which, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from the independent claims discussed above, and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration, or reconsideration, as the case may be, of the patentability of each on its own merits is respectfully requested.

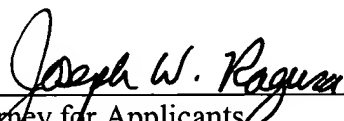
This Amendment After Final Rejection is believed clearly to place this application in condition for allowance and its entry is therefore believed proper under 37 C.F.R.

§ 1.116. At the very least, however, cancellation of Claim 11 clearly eliminates all issues relating to that claim. Accordingly, entry of this Amendment After Final Rejection, as an earnest effort to advance prosecution and reduce the number of issues, is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



Attorney for Applicants
Registration No. 38,586

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MARKED-UP VERSION SHOWING THE CHANGES MADE TO CLAIM 10

Claim 11 has been cancelled without prejudice. Claim 10 has been amended as follows:

10. (Amended) A photoelectric conversion element comprising an anti-reflection layer, [an n⁺ layer, a p⁻ layer] semiconductor layers, and an electrode, provided from the light incident side,

wherein [the] all of the silicon layers are epitaxial silicon layers, and wherein the silicon layers comprise an n⁺ layer and [the] a p⁻ layer [are epitaxial silicon layers and their surfaces are substantially (111)-plane] provided from the light incident side.

11. (Cancelled).

THE PATENT OFFICE OF THE PEOPLE'S REPUBLIC OF CHINA

Address: 6 Xi Tu Cheng Lu, Haidian, Beijing

Post Code: 100088

Applicant:	CANON KABUSHIKI KAISHA	Date of Notification:
Attorney:	WANG YONGGANG	
Application No.:	99111393.4	Date: 18 Month: 10 Year: 2002
Title of the Invention:	CRYSTAL GROWTH PROCESS, SEMICONDUCTOR DEVICE, AND ITS PRODUCTION PROCESS	

Notification of the First Office Action

1. ☒ The applicant requested examination as to substance and examination has been carried out on the above-identified patent application for invention under Article 35(1) of the Patent Law of the People's Republic of China (hereinafter referred to as "the Patent Law").
- ☐ The Chinese Patent Office has decided to examine the application on its own initiative under Article 35(2) of the Patent Law.
2. ☒ The applicant claimed priority/priorities based on the application(s):
- filed in JP on 07/03/98, filed in _____ on _____,
- filed in JP on 07/02/99, filed in _____ on _____,
- filed in _____ on _____, filed in _____ on _____,
- ☒ The applicant has provided the priority documents certified by the Patent Office where the priority application(s) was/were filed.
- ☐ The applicant has not provided the priority documents certified by the Patent Office where the priority application(s) was/were filed and therefore the priority claim(s) is/are deemed not to have been made under Article 30 of the Patent Law.
- ☐ The application is a PCT continuation.
3. ☐ The applicant submitted amendments to the application on _____ and on _____, wherein the amended _____ submitted on _____ and the amended _____ submitted on _____ are not acceptable, because said amendments do not comply with ☐ Article 33 of the Patent Law. ☐ Rule 51 of the Implementing Regulations of the Patent Law.
- The specific reasons why the amendments are not allowable are set forth in the text portion of this Notification.
4. ☒ Examination as to substance was directed to the initial application documents as filed.
- ☐ Examination as to substance was directed to the documents as specified below:
- claims _____, pages _____ of the description and drawings _____ filed on the date of filing,
- claims _____, pages _____ of the description and drawings _____ submitted on _____,
- claims _____, pages _____ of the description and drawings _____ submitted on _____,
- and the abstract, the figure of the drawings in the abstract as submitted on _____,
5. ☐ This Notification is issued without search reports.
- ☒ This Notification is issued with consideration of the search results.
- ☒ Below is/are the reference document(s) cited in this Office Action (the reference number(s) will be used throughout the examination procedure):

No.	Number(s) or Title(s) of Reference(s)	Date of Publication (or the filing date of conflicting application)
1	US5135884A	Date: <u>4</u> Month: <u>8</u> Year: <u>92</u>
2		Date: ___ Month: ___ Year: ____
3		Date: ___ Month: ___ Year: ____
4		Date: ___ Month: ___ Year: ____

6. Conclusions of the Action:

☒ On the Specification:

- ☐ The subject matter contained in the application is not patentable under Article 5 of the Patent Law.
- ☒ The draft of the description does not comply with Rule 18 of the Implementing Regulations.
- ☐ The draft of the description does not comply with Rule 19 of the Implementing Regulations.
- ☐ The draft of the description does not comply with Rule 4 of the Implementing Regulations.

☒ On the Claims:

- ☐ Claim(s) _____ is/are not patentable under Article 25 of the Patent Law.
- ☐ Claim(s) _____ does/do not comply with the definition of inventions prescribed by Rule 2 paragraph 1 of the Implementing Regulations.
- ☐ Claim(s) _____ does/do not possess the novelty as required by Article 22 paragraph 2 of the Patent Law.
- ☒ Claim(s) 1-3, 5, 7 does/do not possess the inventiveness as required by Article 22 paragraph 3 of the Patent Law.
- ☐ Claim(s) _____ does/do not possess the practical applicability as required by Article 22 paragraph 4 of the Patent Law.
- ☐ Claim(s) _____ does/do not comply with Article 26 paragraph 4 of the Patent Law.
- ☐ Claim(s) _____ does/do not comply with Article 31 paragraph 1 of the Patent Law.
- ☒ Claim(s) 4, 6, 9 does/do not comply with the provisions of Rules 20-23 of the Implementing Regulations.
- ☐ Claim(s) _____ does/do not comply with Article 9 of the Patent Law.
- ☐ Claim(s) _____ does/do not comply with the provisions of Rule 12 paragraph 1 of the Implementing Regulations.

7. In view of the conclusions set forth above, the Examiner is of the opinion that:

- ☐ The applicant should make amendments as directed in the text portion of the Notification.
- ☒ The applicant should expound in the response reasons why the application is patentable and make amendments to the application where there are deficiencies as pointed out in the text portion of the Notification, otherwise, the application will not be allowed.
- ☐ The application contains no allowable invention, and therefore, if the applicant fails to submit sufficient reasons to prove that the application does have merits, it will be rejected.

☐

8. The followings should be taken into consideration by the applicant in making the response:

- (1) Under Article 37 of the Patent Law, the applicant should respond to the office action within 4 months counting from the date of receipt of the Notification. If, without any justified reason, the time limit is not met, the application shall be deemed to have been withdrawn.
- (2) Any amendments to the application should be in conformity with the provisions of Article 33 of the Patent Law. Substitution pages should be in duplicate and the format of the substitution should be in conformity with the relevant provision contained in "The Examination Guidelines".
- (3) The response to the Notification and/or revision of the application should be mailed to or handed over to the "Reception Division" of the Patent Office, and documents not mailed or handed over to the Reception Divisions have no legal effect.
- (4) Without an appointment, the applicant and/or his agent shall not interview with the Examiner in the Patent Office.

9. This Notification contains a text portion of 2 pages and the following attachments:

- ☒ 1 cited reference(s), totaling 6 pages. ☐

Examination Dept. 9

Examiner: LUO SUFANG

Seal of the Examination Department



Text of Notification of the First Office Action

Claim 1 seeks protection of a crystal growth process. However, a method of producing isoplanar isolated regions has been disclosed in reference 1, in which the following technical features have been disclosed: the most common crystal orientations for silicon wafer 10 are (100) and (111) planes; in this invention, the substrate should preferably be from a wafer having the (100) orientation; a first epitaxial layer of silicon 12 is grown on the substrate 10 and then anodized, so that substrate 10 becomes porous silicon (see line 66 of column 2 – line 6 of column 3 and lines 44 – 47 of column 3 of description, reference 1). Obviously, difference between claim 1 and reference 1 is: the principal plane of the semiconductor layer is (111)-plane. It has been indicated in reference 1 that the most common crystal orientations for silicon wafer 10 are (100) and (111) planes, in this invention, the substrate should preferably be from a wafer having the (100) orientation. Thereby, reference 1 has provided enlightenment on using a silicon wafer having the (111) crystal orientation as the substrate. Moreover, reference 1 and claim 1 belong to the same technical field – crystal growth of the epitaxial semiconductor. Therefore, claim 1 does not have prominent substantive features and does not represent a notable progress. Claim 1 does not possess the inventiveness stipulated by Article 22 (3) of the Patent Law of the People's Republic of Chinese (CPL).

The additional technical feature claimed in claim 2 is: the porous semiconductor is formed by subjecting the surface of a (111) silicon wafer to anodizing. The following technical features have been disclosed in reference 1: anodizing, so that the silicon wafer 10 becomes porous silicon (lines 44-47 of column 3, reference 1). Obviously, the additional technical feature claimed in claim 2 has been disclosed in reference 1. Since claim 1 does not possess inventiveness, claim 2 does not possess the inventiveness stipulated by Article 22 (3) of the CPL.

The additional technical feature claimed in claim 3 is: said process is carried out by liquid-phase epitaxy. Liquid-phase epitaxy is the common technical means used in the crystal growth process. Since claim 1 does not possess inventiveness, claim 3 does not possess the inventiveness stipulated by Article 22 (3) of the CPL.

Claim 5 seeks protection of a semiconductor device production process. However, a method of producing isoplanar isolated regions has been disclosed in reference 1, in which the following technical features have been disclosed: the most common crystal orientations for silicon wafer 10 are (100) and (111) planes; in this invention, the substrate should preferably be from a wafer having the (100) orientation; a first epitaxial layer of silicon 12 is grown on the substrate 10 and then anodized, so that substrate 10 becomes porous silicon; a second epitaxial layer 18 is grown in the active regions of the first epitaxial layer 12; the regions of the second epitaxial layer 18 are suitable for fabrication of MOS devices (see line 66 of column 2 – line 6 of column 3, lines 44 – 47 and lines 64-68 of column 3 of description, reference 1). Obviously, difference between claim 5 and reference 1 is: the principal plane of the semiconductor layer is (111)-plane. It has been indicated in reference 1 that the most common crystal orientations for silicon wafer 10 are (100) and (111) planes, in this invention, the substrate should preferably be from a wafer having the (100) orientation. Thereby, reference 1 has provided enlightenment on using a silicon wafer having the (111) crystal orientation as the substrate. Moreover, reference 1 and claim 5 belong to the same technical field – crystal growth of the epitaxial semiconductor and semiconductor device production process resulting from such kind of crystal growth. Therefore, claim 5 does not have prominent substantive features and does not represent a notable progress. Claim 5 does not possess the inventiveness stipulated by Article 22 (3) of the Patent Law of the People's Republic of Chinese (CPL).

Claim 7 seeks protection of a semiconductor device. However, the following technical features have been disclosed in reference 1: the most common crystal orientations for silicon wafer 10 are (100) and (111) planes; in this invention, the substrate should preferably be from a wafer having the (100) orientation; a first epitaxial layer of silicon 12 is grown on the substrate 10; a second epitaxial layer 18 is grown in the active regions of the first epitaxial layer 12; the regions of the second epitaxial layer 18 are suitable for fabrication of MOS devices (see line 66 of column 2 – line 6 of column 3, and lines 64-68 of column 3 of description, reference 1). Obviously, differences between claim 7 and reference 1 are: (1) the principal plane of the semiconductor layer is (111)-plane; (2) the active regions are used in photoelectric conversion. It has been indicated in reference 1 that the most common crystal

orientations for silicon wafer 10 are (100) and (111) planes, in this invention, the substrate should preferably be from a wafer having the (100) orientation. Thereby, reference 1 has provided enlightenment on using a silicon wafer having the (111) crystal orientation as the substrate. It is a common technical means for using the active layer in photoelectric conversion in the field. Moreover, reference 1 and claim 7 belong to the same technical field – crystal growth of the epitaxial semiconductor and semiconductor device resulting from such kind of crystal growth. Therefore, claim 7 does not have prominent substantive features and does not represent a notable progress. Claim 5 does not possess the inventiveness stipulated by Article 22 (3) of the Patent Law of the People's Republic of China (CPL).

The meaning of "strict (111) plane" in claims 4, 6 and 9 is unclear. Those skilled in the field can not understand in which case the (111) plane is strict. Therefore, claims 4, 6 and 9 are unclear and are not in conformity with the provisions of Rule 20 (1) of the Implementing Regulations of the Patent Law of the People's Republic of China (IR).

Description should be written with the manner and the order stipulated by Rule 18 (1) of the IR. There should be a heading preceding each part of description.

For the above reasons, the present application can not be patented based on the present text. The applicant should respond to the Office Action within the specified time limit, and present strong arguments supporting the inventiveness of the present invention, and overcome the above-mentioned defects. Otherwise, the present application will fall into the situations stipulated by Rule 53, and will be finally rejected according to the provisions of Article 38 of the CPL.



The Article and the Rules cited by the examiner

Article 22 (3) Inventiveness means that, as compared with the technology existing before the date of filing, the invention has prominent substantive features and represents a notable progress and that the utility model has substantive features and represents progress.

Rule 18 (1) The description of an application for a patent for invention or utility model shall state the title of the invention or utility model, which shall be the same as it appears in the request. The description shall include the following:

(1) technical field: specifying the technical field to which the technical solution for which protection is sought pertains;

(2) background art: indicating the background art which can be regarded as useful for the understanding, searching and examination of the invention or utility model, and when possible, citing the documents reflecting such art;

(3) contents of the invention: disclosing the technical problem the invention or utility model aims to settle and the technical solution adopted to resolve the problem; and stating, with reference to the prior art, the advantageous effects of the invention or utility model;


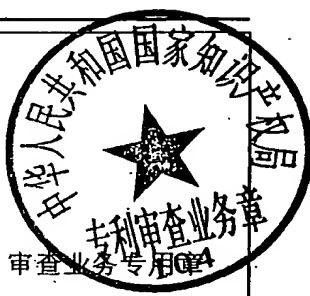

(4) description of figures: briefly describing each figure in the drawings, if any;

(5) mode of carrying out the invention or utility model: describing in detail the optimally selected mode contemplated by the applicant for carrying out the invention or utility model; where appropriate, this shall be done in terms of examples, and with reference to the drawings, if any;

The manner and order referred to in the preceding paragraph shall be followed by the applicant for a patent for invention or for utility model, and each of the parts shall be preceded by a heading, unless, because of the nature of the invention or utility model, a different manner or order would result in a better understanding and a more economical presentation.

Rule 20 (1) The claims shall define clearly and concisely the matter for which protection is sought in terms of the technical features of the invention or utility model.

中华人民共和国国家知识产权局

邮政编码: 100037 北京阜成门外大街 2 号 8 层 中国国际贸易促进委员会专利商标事务所 王永刚		 审查员签章	 审查业务专用章
申请号	99111393.4	部门及通知书类型	9 -C
申请人	佳能株式会社		
发明名称	晶体生长工艺和半导体器件及其制造方法		
			发文日期 

第一次审查意见通知书

1. ☒ 依申请人提出的实审请求, 根据专利法第 35 条第 1 款的规定, 审查员对上述发明专利申请进行实质审查。
☐ 根据专利法第 35 条第 2 款的规定, 国家知识产权局决定自行对上述发明专利申请进行审查。
2. ☒ 申请人要求以在:

日本 专利局的申请日 1998 年 7 月 3 日为优先权日;
 日本 专利局的申请日 1999 年 7 月 2 日为优先权日;
 专利局的申请日 年 月 日为优先权日;
 专利局的申请日 年 月 日为优先权日;
 专利局的申请日 年 月 日为优先权日;
☒ 申请人已经提交了经原申请国受理机关证明的第一次提出的在先申请文件的副本。
☐ 申请人尚未提交经原申请国受理机关证明的第一次提出的在先申请文件的副本, 根据专利法第 30 条的规定视为未提出优先权要求。
3. ☐ 申请人于 年 月 日和 年 月 日提交了修改文件。
 经审查, 其中: 年 月 日提交的 不能被接受;
 年 月 日提交的 不能被接受;
 因为上述修改 ☐ 不符合专利法第 33 条的规定。 ☐ 不符合实施细则第 51 条的规定。
 修改不能被接受的具体理由见通知书正文部分。
4. ☒ 审查是针对原始申请文件进行的。
☐ 审查是针对下述申请文件的:
 申请日提交的原始申请文件的权利要求第 项、说明书第 页、附图第 页;
 年 月 日提交的权利要求第 项、说明书第 页、附图第 页;
 年 月 日提交的权利要求第 项、说明书第 页、附图第 页;
 年 月 日提交的权利要求第 项、说明书第 页、附图第 页;
 年 月 日提交的说明书摘要, 年 月 日提交的摘要附图。
5. ☐ 本通知书是在未进行检索的情况下作出的。
☒ 本通知书是在进行了检索的情况下作出的。
☒ 本通知书引用下述对比文献(其编号在今后的审查过程中继续沿用):

回函请寄: 100088 北京市海淀区蓟门桥西土城路 6 号 国家知识产权局专利局受理处收

2201 2001.7 (注: 凡寄给审查员个人的信函不具有法律效力)

编号	文件号或名称	公开日期
1	US5135884A	1992 年 8 月 4 日
2		年 月 日
3		年 月 日
4		年 月 日

6. 审查的结论性意见:

☒关于说明书:

☐申请的内容属于专利法第 5 条规定的不予授予专利权的范围。

☐说明书不符合专利法第 26 条第 3 款的规定。

☒说明书的撰写不符合实施细则第 18 条的规定。

☐

☒关于权利要求书:

☐权利要求 不具备专利法第 22 条第 2 款规定的新颖性。

☒权利要求 1-3、5、7 不具备专利法第 22 条第 3 款规定的创造性。

☐权利要求 不具备专利法第 22 条第 4 款规定的实用性。

☐权利要求 属于专利法第 25 条规定的不予授予专利权的范围。

☐权利要求 不符合专利法第 26 条第 4 款的规定。

☐权利要求 不符合专利法第 31 条第 1 款的规定。

☐权利要求 不符合专利法实施细则第 2 条第 1 款关于发明的定义。

☐权利要求 不符合专利法实施细则第 13 条第 1 款的规定。

☒权利要求 4、6、9 不符合专利法实施细则第 20 条至第 23 条的规定。

☐

上述结论性意见的具体分析见本通知书的正文部分。

7. 基于上述结论性意见, 审查员认为:

☐申请人应按照通知书正文部分提出的要求, 对申请文件进行修改。

☒申请人应在意见陈述书中论述其专利申请可以被授予专利权的理由, 并对通知书正文部分中指出的不符合规定之处进行修改, 否则将不能授予专利权。

☐专利申请中没有可以被授予专利权的实质性内容, 如果申请人没有陈述理由或者陈述理由不充分, 其申请将被驳回。

☐

8. 申请人应注意下述事项:

(1) 根据专利法第 37 条的规定, 申请人应在收到本通知书之日起的 4 个月内陈述意见, 如果申请人无正当理由逾期不答复, 其申请将被视为撤回。

(2) 申请人对其申请的修改应符合专利法第 33 条的规定, 修改文本应一式两份, 其格式应符合审查指南的有关规定。

(3) 申请人的意见陈述书和/或修改文本应邮寄或递交国家知识产权局专利局受理处, 凡未邮寄或递交给受理处的文件不具备法律效力。

(4) 未经预约, 申请人和/或代理人不得前来国家知识产权局专利局与审查员举行会晤。

9. 本通知书正文部分共有 2 页, 并附有下列附件:

☒引用的对比文件的复印件共 1 份 6 页。

☐

审查 9 部

审查员 骆素芳

审查部门业务专用章

(未加盖审查业务专用章的通知书不具备法律效力)

第一次审查意见通知书正文

权利要求 1 请求保护一种晶体生长工艺,对比文件 1 公开了一种同平面分离有源区的制造方法,并具体公开了以下技术特征:最常见的硅晶片 10 的晶向是 (111) 和 (100),在本发明中,最好使用晶向为 (100) 的硅晶片作为衬底,第一外延层 12 生长在硅晶片 10 上,作阳极化处理,使硅晶片 10 成为多孔硅(参见对比文件 1 说明书第 2 栏第 66 行-第 3 栏第 6 行,第 3 栏第 44-47 行),可见,权利要求 1 与对比文件 1 的区别在于:半导体层的主平面是 (111)。对比文件 1 中指出最常见的硅晶片 10 的晶向是 (111) 和 (100),在本发明中,最好使用晶向为 (100) 的硅晶片作为衬底,因此,对比文件 1 中也给出了晶向为 (111) 的硅晶片作为衬底的启示,并且,对比文件 1 与权利要求 1 属于相同的技术领域 - 外延半导体的晶体生长,因此,权利要求 1 不具备突出的实质性特点和显著的进步,权利要求 1 不具备专利法第二十二条第三款规定的创造性。

权利要求 2 的附加技术特征是:多孔半导体经阳极化处理 (111) 硅晶片表面而形成。对比文件 1 中公开了以下技术特征:作阳极化处理,使硅晶片 10 成为多孔硅(参见对比文件 1 第 3 栏第 44-47 行),可见,对比文件 1 也公开了权利要求 2 的附加技术特征,鉴于权利要求 1 不具备创造性,权利要求 2 也不具备专利法第二十二条第三款规定的创造性。

权利要求 3 的附加技术特征是:该工艺通过液相外延进行。液相外延是晶体生长工艺中常用的技术手段,鉴于权利要求 1 不具备创造性,权利要求 3 也不具备专利法第二十二条第三款规定的创造性。

权利要求 5 请求保护一种半导体器件的制造方法,对比文件 1 公开了一种同平面分离有源区的制造方法,并具体公开了以下技术特征:最常见的硅晶片 10 的晶向是 (111) 和 (100),在本发明中,最好使用晶向为 (100) 的硅晶片作为衬底,第一外延层 12 生长在硅晶片 10 上,作阳极化处理,使硅晶片 10 成为多孔硅,第二外延层 18 生长在第一外延层 12 的有源区内,第二外延层 18 的区域可以作为 MOS 器件的有源区(参见对比文件 1 说明书第 2 栏第 66 行-第 3 栏第 6 行,第 3 栏第 44-47 行,第 3 栏第 64-68 行),可见,权利要求 5 与对比文件 1 的区别在于:半导体层的主平面是 (111)。对比文件 1 中指出最常见的硅晶片 10 的晶向是 (111) 和 (100),在本发明中,最好使用晶向为 (100) 的硅晶片作为衬底,因此,对比文件 1 中也给出了晶向为 (111) 的硅晶片作为衬底的启示,并且,对比文件 1 与权利要求 5 属于相同的技术领域 - 外延半导体的晶体生长及由此形成的半导体器件的制造方法,因此,权利要求 5 不具备突出的实质性特点和显著的进步,权利要求 5 不具备专利法第二十二条第三款规定的创造性。

权利要求 7 请求保护一种半导体器件，对比文件 1 公开了以下技术特征：最常见的硅晶片 10 的晶向是 (111) 和 (100)，在本发明中，最好使用晶向为 (100) 的硅晶片作为衬底，第一外延层 12 生长在硅晶片 10 上，第二外延层 18 生长在第一外延层 12 的有源区内，第二外延层 18 的区域可以作为 MOS 器件的有源区（参见对比文件 1 说明书第 2 栏第 66 行-第 3 栏第 6 行，第 3 栏第 64-68 行），可见，权利要求 7 与对比文件 1 的区别在于：(1) 半导体层的主平面是 (111)，(2) 该有源层用于光电转换。对比文件 1 中指出最常见的硅晶片 10 的晶向是 (111) 和 (100)，在本发明中，最好使用晶向为 (100) 的硅晶片作为衬底，因此，对比文件 1 中也给出了晶向为 (111) 的硅晶片作为衬底的启示。在半导体器件中，将有源层用于光电转换是本领域的常用技术手段。并且，对比文件 1 与权利要求 7 属于相同的技术领域 - 外延半导体的晶体生长及由此形成的半导体器件，因此，权利要求 7 不具备突出的实质性特点和显著的进步，权利要求 7 不具备专利法第二十二条第三款规定的创造性。

权利要求 4, 6, 9 中“严格的 (111) 平面”不清楚，本领域的普通技术人员不能明白什么情况下属于“严格的”(111) 平面，因此，权利要求 4, 6, 9 不清楚，不符合专利法实施细则第二十条第一款的规定。

说明书应当按照专利法实施细则第十八条第一款规定的方式和顺序撰写，在每一部分前面写明标题。

基于上述理由，目前的申请文本不能被授予专利权，申请人应当在指定的答复期限答复本审查意见通知书，陈述本申请具有创造性的充分的理由，并克服上述缺陷，否则本申请属于专利法实施细则第五十三条规定的情形，将依照专利法第三十八条的规定被驳回。